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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,287	02/12/2002	Imad Mahawili	MIC04 P-113	4900

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EXAMINER	
FUQUA, SHAWNTINA T	
ART UNIT	**PAPER NUMBER**
3742	

DATE MAILED: 09/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,287	MAHAWILI, IMAD	
	Examiner	Art Unit	
	Shawntina T. Fuqua	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-16,18,19,21-33,51-60 and 62-77* is/are pending in the application.

4a) Of the above claim(s) *11-15,23-33,51-60 and 70-74* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-10,16,18,19,21,22 and 62-69* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 April 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/12/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 3-4, 21, 62-64, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US5219786) in view of Neev (US6156030).

Noguchi discloses a processing chamber to support a substrate (1) therein means for applying a first energy source to a non-device side and applying a second pulse energy source to a device side wherein the intensity of the first energy is less than the pulse energy and the duration of the pulse energy is less than the duration of the first energy to control the depth of junctions, the pulse energy is 1 microsecond to 2 or 3 seconds, and heating the device side to at least 900 degrees Celsius (column 2, line 31- column 3, line 23, Figure 1a and 1c). Noguchi does not disclose a pulse energy duration in the range of 100-400 milliseconds, a pulse energy source adapted to heat to a depth in the range of 1-5 micrometers, and a pulse energy source chosen from a tungsten halogen or xenon lamp. Neev discloses a pulse energy duration in the range of 100-400 milliseconds (column 9, lines 57-63), a pulse energy source adapted to heat to a depth in the range of 1-5 micrometers (column 28, lines 8-21), and a pulse energy source chosen from a tungsten halogen or xenon lamp (column 49, lines 26-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a pulse

energy duration in the range of 100-400 milliseconds, a depth of 1-5 micrometers, and a xenon lamp as a pulse energy source as taught by Neev in the apparatus of Noguchi because, a pulse energy duration in the range of 100-400 milliseconds, a depth of 1-5 micrometers, and a xenon lamp as a pulse energy source prevents damage/overheating of the non-device side of the substrate.

3. Claims 5-8, 22, 65, and 67-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Neev as applied to claims 3-4, 21, and 62-64 above, and further in view of Mahawili (US5959896).

Noguchi in view of Neev discloses all of the recited subject matter except a first energy source with a peak energy of 0.2-3.0 microns, and a plurality of tungsten halogen lamps wherein the lamps have a longitudinal extent and first group of lamps are parallel with a side and having a first heating zone about the perimeter and a second group of lamps at a second spacing from a side to heat a central region. Mahawili discloses a first energy source with a peak energy of 0.2-3.0 microns, and a plurality of tungsten halogen lamps wherein the lamps have a longitudinal extent and first group of lamps are parallel with the a side and having a first heating zone about the perimeter and a second group of lamps at a second spacing from the a side to heat a central region (column 5, lines 15-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the peak energy and lamps of Mahawili in the apparatus of Noguchi along with the pulse energy duration and depth of Neev because, a peak energy of 0.2-3.0 microns, and a plurality of lamps with separate zones allows the substrate to be heated more uniformly.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Talwar et al (US6645838).

Noguchi discloses all of the recited subject matter except a pulse energy source with a peak wavelength in a range of 0.2-0.9 microns. Talwar et al discloses a pulse energy source with a peak wavelength in a range of 0.2-0.9 microns (column 7, lines 53-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the pulse energy source with a peak wavelength in a range of 0.2-0.9 microns as taught by Talwar et al in the apparatus of Noguchi because, a pulse energy source with a peak wavelength in a range of 0.2-0.9 microns allow the region of the substrate to melt to achieve activation of the doped region.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Talwar et al as applied to claim 9 above, and further in view of Neev (US6156030).

Noguchi in view of Talwar et al discloses all of the recited subject matter except a xenon pulse energy source. Neev discloses a xenon pulse energy source (column 49, lines 26-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the xenon pulse energy source of Neev in the apparatus of Noguchi along with the peak wavelength of Talwar et al because, a xenon pulse energy source allows the device side of the substrate to be heated more efficiently.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Talwar et al and Neev as applied to claim 10 above, and further in view of Mahawili ('896).

Noguchi in view of Talwar et al and Neev discloses all of the recited subject matter except a plurality of tungsten halogen lamps wherein the lamps have a longitudinal extent and

first group of lamps are parallel with a side with a first heating zone and a second group of lamps parallel to the same side of the substrate and defining a second heating zone wherein the zones are independently controlled. Mahawili discloses a plurality of tungsten halogen lamps wherein the lamps have a longitudinal extent and first group of lamps are parallel with a side with a first heating zone and a second group of lamps parallel to the same side of the substrate and defining a second heating zone wherein the zones are independently controlled (column 5, lines 15-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the independently controlled zones of Mahawili in the apparatus of Noguchi along with the peak wavelength of Talwar et al and the xenon lamp of Neev because, independently controlled heating zones allow the substrate to be heated more uniformly.

7. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Neev as applied to claim 21 above, and further in view of Mahawili (US5814365).

Noguchi in view of Neev discloses all of the recited subject matter except rotating the substrate during processing in a range of 5-300 rpm. Mahawili discloses rotating the substrate during processing in a range of 5-300 rpm (column 5, lines 40-48). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included rotating the substrate as taught by Mahawili in the apparatus of Noguchi because, rotating the substrate allows the dopants to be deposited more evenly.

8. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Neev and Mahawili ('896) as applied to claim 65 above, and further in view of Talwar et al.

Noguchi in view of Neev and Mahawili discloses all of the recited subject matter except a second/pulse energy source which generates a peak wavelength in a range of 0.2-0.9 microns.

Talwar et al discloses a second/pulse energy source which generates a peak wavelength in a range of 0.2-0.9 microns (column 7, lines 53-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the pulse energy source with a peak wavelength of 0.2-0.9 microns as taught by Talwar et al in the apparatus of Noguchi along with the pulse energy duration and depth of Neev and the lamps of Mahawili because, a pulse energy source with a peak wavelength of 0.2-0.9 microns allow the region of the substrate to melt to achieve activation of the doped region.

Allowable Subject Matter

9. Claims 75-77 are allowed.

Response to Arguments

10. Applicant's arguments with respect to claims 3-10, 16, 18-19, 21-22, 62-69, 75-77 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawntina T. Fuqua whose telephone number is (703) 305-2581. The examiner can normally be reached on Monday-Friday 8-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on (703) 305-5766. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

stf
August 27, 2004

Shawntina Fuqua
Patent Examiner
Art Unit 3742